

Name: _____
Period: _____ Table: _____

Work

- Work is the amount of Force (F) applied over a Distance (d).
- The applied Force and the Distance **must be parallel**.
- Work is done **by** something or someone **on** something or someone.
- **Work is measured in Joules (J).**
- Work is the transfer of energy from one object to another.

$$\text{Work} = F_{\parallel} d$$

Power (P)

- P is the Work (Work) done in a particular time (Δt).
- **P is measured in Watts (W).**

$$P = \text{Work} / \Delta t$$

Potential Energy (PE)

- PE is Stored Energy.
- **PE is measured in Joules (J).**

- Gravitational Potential Energy (PE_g)

- PE_g is the stored energy of **Height (h)**

$$PE_g = mgh$$

- Elastic Potential Energy (PE_e)

- PE_e is the stored energy of **a compressed or stretched spring or a stretched rubber band.**

$$PE_e = 1/2 k x^2$$

- Chemical Potential Energy (PE_c)

- PE_c is the stored energy **in an atom or compound**

- Food Potential Energy (PE_f)

- PE_f is the stored energy **in food.**

Kinetic Energy (KE)

- KE is Energy of Motion [velocity (v)].
- **KE is measured in Joules (J).**

$$KE = 1/2 m v^2$$

Mechanical Energy (ME)

- The ME of an object is the sum of its Potential Energy (PE) and its Kinetic Energy (KE).
- **ME is measured in Joules (J).**

$$ME = PE + KE$$

Conservation of Energy (First Law of Thermodynamics)

- Energy can not be created or destroyed. It can be changed from one form to another.
- "Energy Loss" is energy that is changed into the useless energy forms of sound, heat and light.

Efficiency (e)

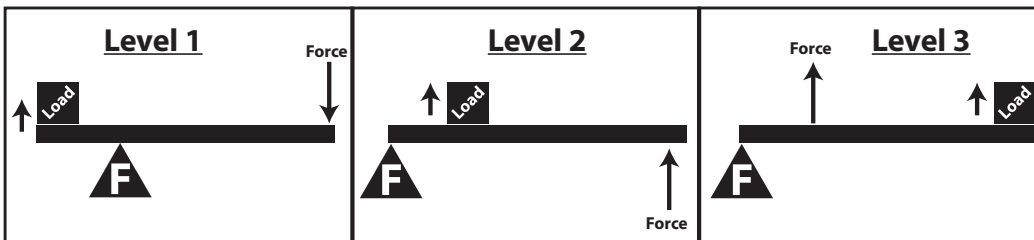
- e is the ratio of the Work out and the Work in
- e can **never** be greater than 100%
- **e is measured in Percent (%)**.

$$e = \frac{\text{Work out}}{\text{Work in}} \times 100\%$$

Simple Machines (SM)

- A Simple Machine is a machine that makes a task easier (requires less Force (F)) or quicker (requires less time (t)).
- **SM's do not change the amount of Work that is done.**

- **Lever** - uses an "arm" and a fulcrum point to move an object.



- **Pulley** - uses a series of wheels and ropes/chains.



- **Inclined Plane** - uses a ramp to change heights.



- **Screw** - uses a screw to move objects.
Converts Circular Force to Linear Force



- **Wheel and Axle** - uses wheels and axle to move objects.



- **Wedge** - uses a wedge to split, cut, or lift things.

